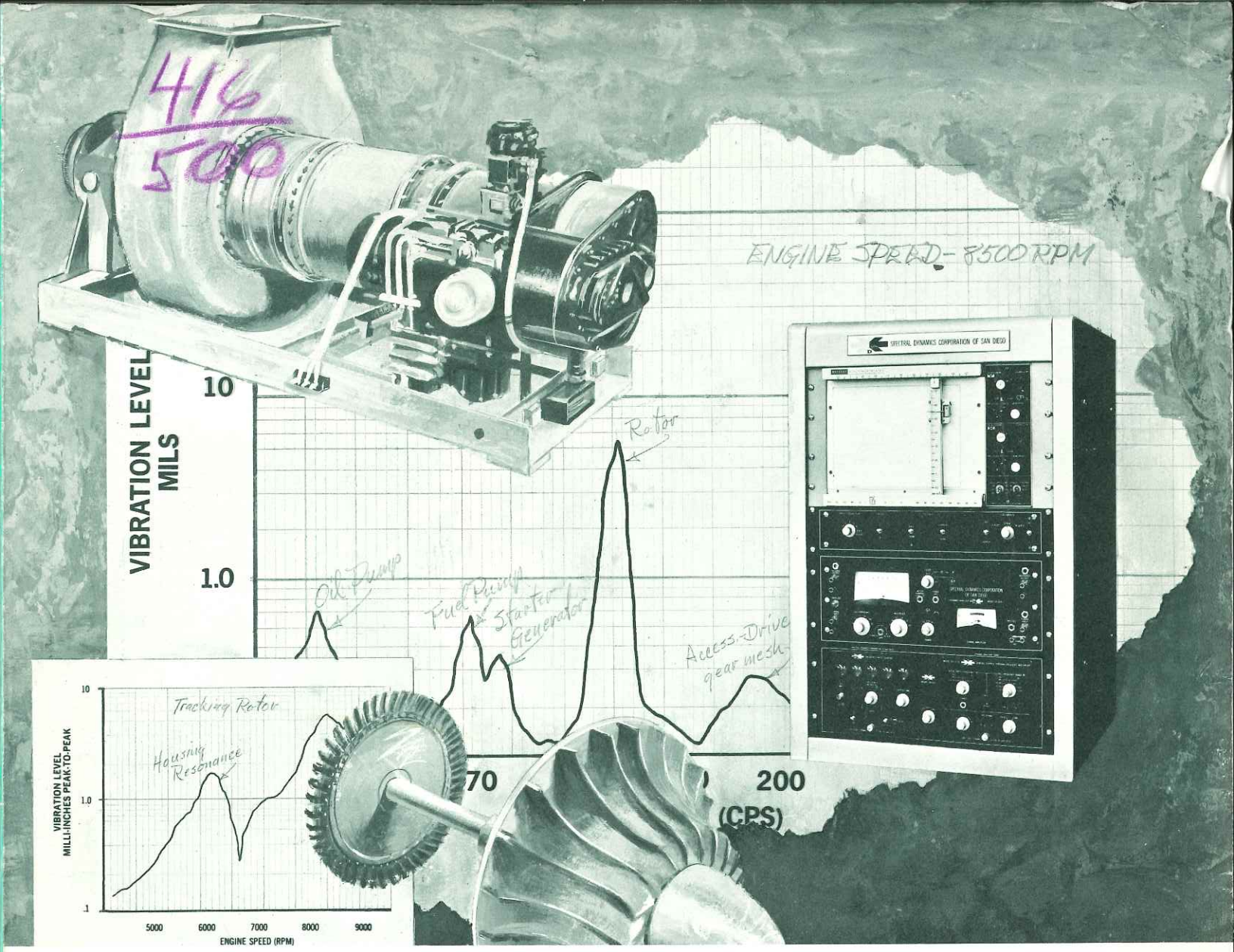


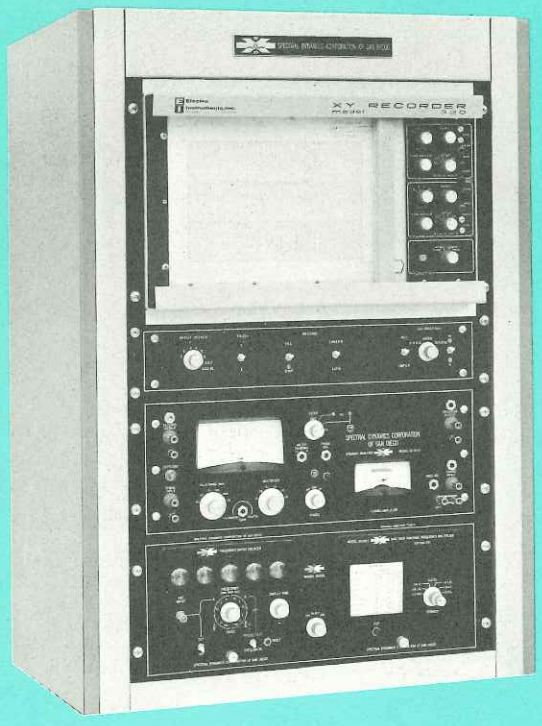
An important message about

VIBRATION ANALYSIS

to everyone who designs, manufactures, uses and services turbines and accessories

NOW... FAST, DIRECT, ACCURATE PLOTTING OF YOUR TURBINE'S PERFORMANCE

WITH SPECTRAL DYNAMICS CORPORATION'S NEW SD-1005 VIBRATION ANALYSIS SYSTEM, THERE IS FINALLY A FAST AND DIRECT WAY TO PLOT EVERY CHARACTERISTIC OF A TURBINE . . . **IN DETAIL** . . . WHILE IT IS OPERATING.



THE SD-1005 . . . TWO MODES OF OPERATION FOR ANALYZING TURBINES, PARTS AND ACCESSORIES

- Run the turbine at a constant speed, and you can plot a harmonic analysis, i.e., the overall vibration characteristics of the basic unit **and** its accessories: pumps, gear-reducers, alternators, mufflers, compressors.

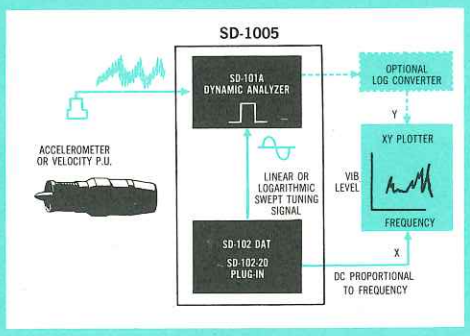
- Accelerate it through its entire speed range, and you get direct, permanent plots of vibration level vs. RPM for all critical parts.

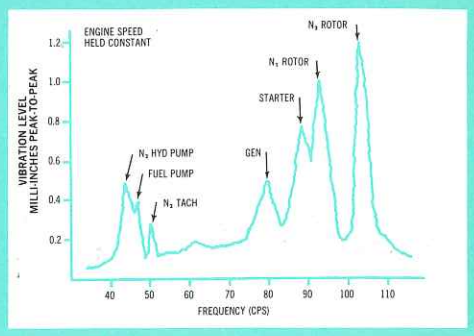
The SD-1005 is adaptable to tests on every type of turbine . . . is of equal value in the development lab and on the production or service test stand, where it permits total engine evaluation and even makes it possible to predict—and thus avoid—breakdowns. It works with equal accuracy from accelerometers and velocity pickups or analyzes taped data. Multiple input channels and a selector switch make it possible to track up to six critical test points. Its frequency range covers the broad area from lcps to 30kc.

On the opposite page, three of the SD-1005's operating modes are shown in detail. Our Sales Representatives will be pleased to discuss them with you in detail and arrange a demonstration at your facilities.

THREE STEPS TO COMPLETE TURBINE ANALYSIS

1st PLOT AN OVERALL VIBRATION "PORTRAIT"

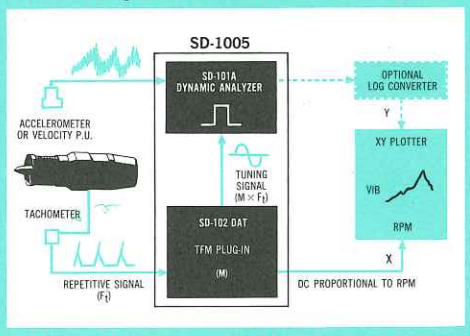


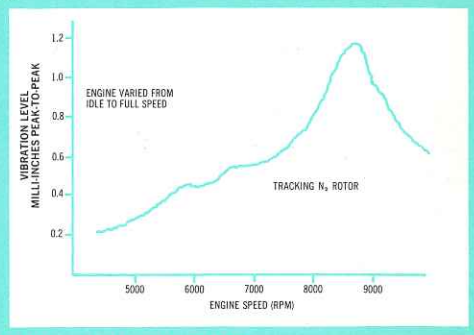


THE "SWEPT-FREQUENCY MODE" FOR HARMONIC ANALYSIS

By holding the apparatus under test (e.g., a jet engine) at constant RPM and feeding a swept tuning signal from the SD-102-20 Linear/Log Sweep Generator Plug-In to the SD-101A, a direct and accurate harmonic analysis may be accomplished. The system plots the engine's over-all vibration "portrait" as shown at the right, above.

2nd TRACK THE INDIVIDUAL COMPONENTS

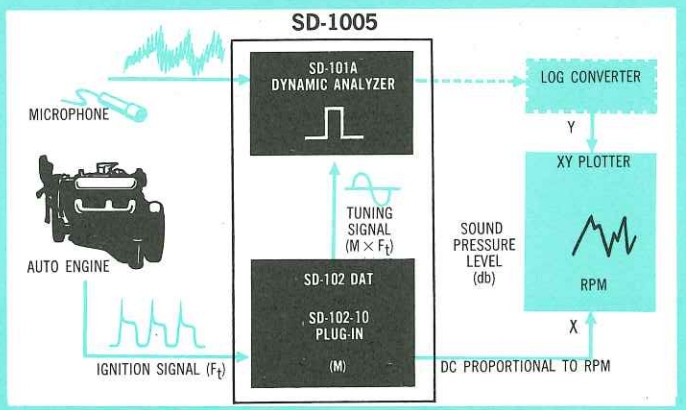




THE "TFM" MODE FOR TRACKING INDIVIDUAL COMPONENTS

Following the harmonic analysis, acceleration runs are made, using the SD-102-10 TFM Plug-In. The TFM selects a multiple (M) to tune the SD-101A to any desired ratio times main-shaft RPM. As engine speed varies, the system continuously tracks to maintain (M) at the constant value selected. Thus, the SD-101A receives a synchronous tuning signal ($M \times F_t$), enabling the system to make an accurate dynamic analysis of a component or accessory as a function of engine speed. The X-Y plot at right, above, is in effect a detailed examination of a single point on the harmonic analysis plot.

3rd ANALYZE THE ACOUSTICAL PATTERNS



In another important area of application, the SD-1005 System can be used for dynamic acoustical analysis of automotive and diesel engines, turbines, compressors, pumps and other rotating machinery. A prime example is the growing field of industrial gas turbines, where housings and exhaust systems must be designed to achieve acceptable sound levels through optimum damping of noise peaks. Power takeoff units and gear drives to connect the turbines to their driven loads must also have acceptable noise patterns, which may be directly and accurately plotted with the SD-1005 System. In this application, the tuning signal to the SD-101A ($M \times F_t$) is a selected multiple of the firing frequency (F_t). The microphone signals to the Dynamic Analyzer—noise components that are multiples of the firing frequency—can thus be analyzed as direct functions of engine RPM. The identical principle is applicable to gas turbine testing.

THE SD-1005 SYSTEM

FOR ANALYZING VIBRATION IN ROTATING MACHINERY

An SD-1005 Rotating Machinery Vibration Analysis System includes the following component units . . .

- SD-101A Dynamic Analyzer
- SD-102 Dynamic Analyzer Tuner (DAT)
- SD-102-20 L/LSG Plug-In Module
- SD-102-10 TFM Plug-In Module
- Master Control Panel
- 8½ × 11″ X-Y Recorder

SYSTEM SPECIFICATIONS

Frequency Range	Swept Frequency Mode: 1 cps to 30 kc Tracking Mode: Tach/Tuning Input – 10 cps to 12.5 kc Analysis Input – 1 cps to 30 kc
Frequency Response	±0.5 db
Input Impedance	10 k ohm through channels 1 to 6; 1 megohm direct
Sensitivity	1 mv to 1000 volts, full-scale
Tach/Tuning Input	50 mv to 50 volts rms (without adjustment)
Analysis Bandwidth	Accommodations provided for two plug-in crystal filters. Standard bandwidths available: 2, 5, 10, 20, 50 and 100 cps. Shape factor (60 DB/3 DB bandwidth) of each filter nominally 4 to 1. Other bandwidths available on special order.
Calibration	Internal; no external equipment required
Input/Output Availability	On rear panel of system
Power Requirements	105-125 v ac; 50/60/400 cps; 400 watts (approx.)
Size	All equipment mounted in standard 19″ rack: 34″ high × 23½″ wide × 24″ deep
Weight	125 pounds (approx.)

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SPECTRAL DYNAMICS CORPORATION OF SAN DIEGO

POST OFFICE BOX 671,
SAN DIEGO, CALIFORNIA 92112, TELEPHONE 714-278-2501